The impact of environmental policies on corporate environmental protection practices

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Abstract:

Since the reform and opening up, the Chinese economy has created a development miracle that has attracted worldwide attention. However, behind the rapid economic development is the rapid deterioration of the ecological environment. With the increase in China's economic size, the development mode of high pollution and high energy consumption is becoming increasingly difficult to sustain, and environmental pollution is receiving more attention from the public and the government. In this context, this article explores the impact of environmental policies on corporate environmental protection practices. By dividing environmental policies into three categories: administrative command control, market incentive, and public participation, this study found that different policy types have different effects on reducing corporate pollution emissions, promoting environmental investment, and green innovation. Although administrative command control policies can restrict corporate emissions, they rely on government law enforcement efforts. Market incentive policies incentivize enterprises to reduce emissions and increase environmental investment through economic means. Public participation policies influence corporate and government behaviour through public opinion pressure. Overall, environmental policies can effectively promote corporate environmental practices. However, it is necessary to combine different policies, strengthen government enterprise cooperation, and enhance public environmental awareness to build a better ecological civilization.

Keywords: Environmental policies; Environmental investment; Green innovation.

1. Introduction

Since the implementation of China's reform and opening-up policy in 1978, the Chinese economy has created a development miracle that has attracted worldwide attention. According to data from the World Bank, from a longitudinal comparison perspective, China's GDP has grown 346 times in 45 years, from 364.5 billion yuan in 1978 to 126058.2 billion yuan in 2023. In horizontal comparison, China's per capita GDP 1978 was only \$156, ranking 134th globally. In 2023, China's per capita GDP will reach 12500 US dollars, ranking 69th globally. However, behind the rapid economic development is the rapid deterioration of the ecological environment. For a long time, the development of the Chinese economy has lacked a comprehensive and sustainable systematic development plan. Behind the high economic growth is high consumption, high emissions, and high pollution. With the increase in China's economic size, the high pollution and high energy consumption development mode is becoming increasingly difficult to sustain. China's industrial output value is already the highest in the world, and the environmental and ecological pressures caused by high energy consumption are increasingly affecting people's health. Environmental pollution is receiving increasing attention from the public and the government. The Chinese government stated in the report of the 18th National Congress of the Communist Party of China that ecological civilization construction is an essential aspect of the overall layout of the socialist cause with Chinese characteristics, which marks that ecological civilization construction has become a national strategy. In the new era of further promoting economic development towards high-quality development, we need to use various means to promote environmental protection work and solve economic development's resource and environmental bottlenecks.

Environmental damage refers to the number of pollutants released in a short period during human production and daily activities that exceed the threshold of natural self-purification ability. From the microeconomics perspective, the environment's self-purification ability is a public resource with dual characteristics of nonexclusivity and competitiveness. This means that under natural conditions, any individual or enterprise seeking to utilize the self-purification capacity of the environment can discharge without paying additional fees. However, the limited nature of this resource must be addressed. Under the premise of maintaining ecological balance, individuals' self-purification invisibly weakens the possibility of other individuals enjoying equal resources.

As the main entities in economic activities, enterprises are the main source of environmental pollution. Driven by the pursuit of profit maximization, without adequate supervision and constraints, enterprises often tend to maximize their pollutant emissions to achieve higher production output and profit returns. However, from the perspective of overall social welfare, because the cost of environmental pollution is not directly borne by producers but is shared by the entire society, the overall production level exceeds the ideal state when social welfare is maximized, ultimately leading to a significant loss of overall social welfare. Faced with increasingly severe environmental pollution challenges and the deep expectations of the public for a high-quality living environment, the country and government have placed environmental protection at an unprecedented strategic level. In this context, this study focuses on the implementation effects of environmental policies, systematically analyzing the specific impacts of different environmental policies on corporate environmental protection practices to provide a scientific basis for government decision-making departments and optimize environmental policy formulation. At the same time, this study is also committed to laying a theoretical foundation for building a scientific and efficient environmental governance system in the future, aiming to effectively guide enterprises to actively engage in environmental protection through scientific and reasonable incentive mechanisms and achieve a win-win situation of economic and ecological benefits.

2. Characteristics of environmental protection policies

Environmental protection policies, as essential tools for addressing environmental pollution and ecological damage, have various types and characteristics. Due to the differences in policy rigidity, environmental policies can be divided into three categories: administrative command control, market incentive, and public participation^[1]. In addition, some scholars have classified environmental policies into pre-guidance and post-punishment based on the time nodes of environmental regulation^[2]. Alternatively, it can be classified into control type, investment type, and expense type according to the specific mode of policy action^[3]. Although these classification methods have their focuses, they all help us to have a more comprehensive understanding of the diversity and complexity of environmental policies. To conduct in-depth research and analysis, this article adopts a classification framework of administrative command control, market incentives, and public participation-based environmental regulation, aiming to explore the specific impact of various environmental policies on corporate environmental protection practices and the underlying mechanisms and provide ISSN 2959-6149

strong support for the government to formulate scientific and reasonable environmental policies^[4].

Administrative command-controlled environmental protection policy is one of the government's core tools in environmental protection, which enforces constraints on the pollution behaviour of economic entities through laws, regulations, and various systems. The specific implementation measures include promulgating the new Environmental Law, the environmental impact assessment system, the "three simultaneities" system, the issuance of permits, work stoppages and production restrictions, and deadline management. From a historical perspective, administrative command and control environmental policies are the earliest environmental protection measures implemented globally, and their application scope is also the most extensive. This policy model can quickly and effectively reduce the pollution emissions of enterprises, especially for those with weak environmental awareness or outdated technology.

The theoretical basis of market incentive-based environmental policies is the Coase theorem, which states that in the context of unclear property rights definition leading to resource misallocation and market failure, by clarifying the property rights of environmental carrying capacity, external diseconomies are transformed into internal costs and market mechanisms are used to guide enterprises to reduce pollution emissions and increase environmental investment independently. The core of such policies is to internalize the external costs of environmental pollution into the production costs of the enterprise itself, thereby incentivizing the enterprise to take proactive environmental protection measures. Economic measures such as pollution fees, sulphur dioxide emission trading, carbon emission trading, and environmental subsidies are essential tools to achieve this goal.

Public participation-based environmental protection policies are more indirect than the first two policies. This policy type emphasizes the role of public supervision and participation in environmental protection, increasing social public opinion pressure through reporting and petitioning, forcing the government to strengthen environmental supervision or companies to reduce emissions. The public's yearning for a better life and expectations for corporate social responsibility are important driving forces for implementing this policy. In today's increasingly sophisticated ESG rating system, a company's environmental performance has become important to its brand image and social reputation. Therefore, to avoid damaging brand image and reputation due to environmental pollution, more and more companies are taking proactive environmental protection measures. Public participation-based environmental policies stimulate the intrinsic motivation of enterprises to reduce pollution emissions spontaneously, increase environmental investment, and engage in green innovation.

3. Mechanism analysis of the impact of heterogeneous environmental protection policies

The public nature of the ecological environment fundamentally determines that its quality improvement can only be achieved with effective government management^[5]. For a long time, the impact of environmental protection policies on corporate environmental protection practices has been a focus of academic attention.

Early research generally believed that the primary goal of environmental policies was to promote energy conservation, emission reduction, and environmental protection. On the one hand, the government directly reduces pollutant emissions by shutting down high-polluting and high-emission enterprises and limiting their production. On the other hand, through economic means such as levying emission taxes, companies are indirectly forced to reduce pollution emissions^[6,7]. However, as research continues to deepen, scholars have gradually discovered significant differences in the effectiveness of different types of environmental policies, and some have even questioned whether they can genuinely promote environmental protection. For example, Sinn's "Green Paradox" is a thought-provoking viewpoint. He believes that due to the time lag between policy introduction and implementation, more relaxed environmental policies may incentivize chemical fuel suppliers to accelerate mining to cope with possible future restrictions and instead accelerate environmental degradation. To avoid the generalization error, this article advocates for an in-depth analysis of different types of environmental policies one by one, providing more detailed theoretical support for the scientific formulation of relevant policies.

3.1 Analysis of the Mechanism of Administrative Command controlled Environmental Protection Policy

As pioneers and cornerstones in environmental protection, administrative command control-based environmental protection policies have been widely practiced globally with their mandatory laws, regulations, and administrative orders, becoming an essential strategy for governments worldwide to promote the implementation of environmental protection by enterprises.

Such policies not only set strict environmental thresholds for market entities but also ensure the rigid implementation of environmental standards through corresponding punishment mechanisms, demonstrating direct and significant effects in reducing the intensity of corporate emissions. Numerous cross-border cases, such as Hettige et al.'s research on 12 countries, including the United States, China, Pakistan, and India, have powerfully demonstrated the positive role of such policies in promoting companies to reduce chemical wastewater emissions^[8]. Similarly, Cole's analysis based on US industrial production data also revealed its effectiveness in reducing air pollution source emissions, although this effect may be limited by specific threshold effects^[9].

On an indirect level, administrative command-controlled environmental policies have profoundly impacted corporate environmental investment and technological innovation. On the one hand, policies incentivize non-compliant enterprises to increase environmental investment to meet regulatory requirements by setting clear emission standards. However, this incentive effect is relatively limited for compliant enterprises. On the other hand, in green innovation, such policies also encourage enterprises with lower pollution levels to increase their technological innovation efforts continuously. However, it is worth noting that the "crowding out effect" during policy implementation may also pressure enterprises' innovation investment, and policymakers must pay sufficient attention to it. Meanwhile, implementing administrative command-controlled environmental protection policies relies on government departments' enforcement strength and intensity. However, government departments have a preference for pursuing higher GDP, which often leads to ineffective punishment and lax enforcement of relevant laws. At the same time, companies usually have a mentality of luck and continue to maintain high-intensity pollution levels for possible profits.

3.2 Analysis of the Mechanism of market-driven Environmental Protection Policy

As an essential part of the modern environmental governance system, market-driven environmental protection policies are increasingly valued by countries worldwide and have become a powerful supplement to administrative command and control policies. The core lies in converting the external costs of environmental pollution into internal costs for enterprises through precise market pricing mechanisms, thereby utilizing the "invisible hand" of market mechanisms to guide enterprises to reduce pollution emissions and actively achieve environmentally friendly production. Market-driven environmental policies, such as pollution fees, sulphur dioxide, carbon emissions trading, environmental subsidies, etc., convert the external costs of environmental pollution into internal costs for enterprises through a series of economic means. This transformation not only reflects the fair principle of "polluter pays" but also motivates enterprises to adopt energy-saving and emission-reduction measures to reduce production costs through the transmission of market signals. Specifically, enterprises with low pollution levels can enjoy lower production costs and even profit through pollution trading. Environmental subsidies directly provide economic incentives for enterprises, enhancing their internal motivation for environmental protection practices.

Multiple empirical studies have confirmed the direct impact of market-based environmental policies on corporate environmental practices. For example, Du et al. used microdata from Chinese industrial enterprises to demonstrate that environmental taxes and emissions trading effectively reduce enterprises' pollution emissions and improve environmental protection practices^[10]. Huang et al.'s research also shows that China's carbon emissions trading system has significantly reduced carbon dioxide emissions^[11]. These research results indicate that market incentive policies can directly promote enterprises to reduce pollution emissions and improve environmental performance^[12].

The indirect impact of market-driven environmental policies on corporate ecological practices must be addressed. On the one hand, enterprises with low pollution emission levels are more inclined to increase environmental investment to further reduce production costs due to their production cost advantages, forming a virtuous cycle. On the other hand, the cost reduction brought by environmental investment provides financial support for enterprise technological innovation, prompting enterprises to adopt more environmentally friendly and efficient production technologies, thereby improving the overall environmental protection level of the industry. Li et al.'s research indicates that market incentive policies can effectively promote technological innovation in Chinese high-tech enterprises^[13].

3.3 Analysis of the Mechanism of Public Participation-based Environmental Protection Policy

As an important component of the modern environmental governance system, public participation-based environmental protection policies indirectly influence the behaviour of enterprises and governments through public opinion pressure formed through channels such as letters and visits, news media, etc., and promote environmental protection practices. This policy model embodies the concept of social co-governance, which involves the participation of the public, businesses, and government in environmental protection, forming a solid synergy. The core of public involvement in environmental protection policies ISSN 2959-6149

lies in utilizing the power of public opinion to create solid social supervision over environmental pollution issues. The effectiveness of this mechanism highly depends on the level of public awareness and participation in environmental protection. With the popularization of ESG (Environmental, Social, Governance) concepts, enterprises, as important entities in economic operation, are increasingly required to assume social responsibility, providing a solid social foundation for public participation in environmental protection policies.

The direct impact of public participation-based environmental protection policies is more complex than the other two types of protection policies. When the public voices their opinions on environmental pollution issues, the government often faces public pressure and strengthens its supervision of environmental pollution problems. The strengthening of such supervision will directly or indirectly affect the production behaviour of enterprises, prompting them to reduce pollution emissions. Against the backdrop of increasing public awareness of environmental protection, the environmental performance of enterprises has become an important component of their brand image. Enterprises that actively participate in environmental protection practices can gain the favour of consumers and suppliers' support, thereby gaining advantages in market competition. With the continuous improvement of the ESG rating system, the public's preference for companies with good ESG performance is gradually increasing. This forces companies to prioritize environmental investments and technological upgrades to achieve green transformation, enhance ESG ratings, and gain more significant competitive advantages in the market. Liao and Shi's (2018) study found that public environmental demands can strengthen the strictness of local governments in implementing environmental regulations, thereby promoting green investment by enterprises^[14]. This research further validates the effectiveness of public participation-based environmental policies. In addition, many practical domestic and international cases have shown that when public environmental awareness is high, companies often take the initiative to increase environmental investment, improve production processes, and reduce pollution emissions to maintain their brand image and market share.

4. Conclusion

With the rapid development of global productivity, the negative impact of corporate production activities on the environment is becoming increasingly prominent, and the public's environmental awareness is also increasing synchronously. As a typical market failure phenomenon, environmental pollution urgently requires effective intervention from third parties for its governance. As an important means of government intervention in environmental management, environmental protection policies aim to reduce pollution emissions in society. However, the mechanisms of different environmental policies vary, and studying a single policy can lead to one-sided conclusions. In this article, after categorizing environmental policies, the impact of environmental policies on corporate environmental protection practices is analyzed based on the characteristics of each type of policy. Moreover, draw the following conclusion. Firstly, environmental protection policies can effectively reduce the pollution emissions level of enterprises as a whole and increase their environmental protection behaviour. However, the effects of different environmental protection policies are different, and their mechanisms of action have their characteristics. Secondly, the application of administrative command control environmental protection policies is the most widespread, and it can reduce the pollution emissions of enterprises to a certain extent. However, this effect depends on the government's emphasis on economic growth targets and the strength of law enforcement. At the same time, the effectiveness of administrative command control environmental protection policies in promoting environmental investment and technological upgrading in enterprises could be improved. Thirdly, market-oriented environmental protection policies can encourage enterprises to reduce pollution emissions while incentivizing enterprises to invest in environmental protection and upgrade their technologies. Fourthly, the effectiveness of public participation-based environmental protection policies is more indirect than that of other policies, and whether they can be effective depends on the public's environmental awareness. When environmental awareness is high, such policies can encourage companies to voluntarily reduce environmental pollution, increase environmental investment, and engage in green innovation.

This article proposes three suggestions for different environmental protection policies. Firstly, when proposing environmental protection policies, policymakers should fully utilize the differences between various policies, flexibly utilize different policies based on the current situation of enterprises, avoid the adverse effects that a single policy may bring, and achieve targeted treatment. Secondly, enterprises need to establish good communication channels between governments and strengthen government enterprise cooperation so that environmental governance policies can benefit enterprises. Thirdly, further strengthening the public and enterprises' environmental awareness is necessary. On the one hand, this will enable the public to enjoy the benefits of a beautiful environmental awareness can better motivate enterprises to engage in environmental practices, achieve survival of the fittest among enterprises, and promote industrial upgrading.

In summary, environmental policies play an important role in promoting corporate environmental practices, but the selection and implementation of policies need to consider their differences and comprehensiveness. By scientifically formulating policies, strengthening government enterprise cooperation, and raising public awareness, we can better respond to environmental pollution challenges and achieve sustainable economic and environmental development.

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